

DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

Office of Structural Materials

Quality Assurance and Source Inspection



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Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 1.28**WELDING INSPECTION REPORT****Resident Engineer:** Pursell, Gary**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** WIR-012984**Date Inspected:** 10-Apr-2010**Project Name:** SAS Superstructure**OSM Arrival Time:** 630**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 1430**Contractor:** American Bridge/Fluor Enterprises, a JV**Location:** Job Site**CWI Name:** See Below**CWI Present:** Yes No**Inspected CWI report:** Yes No N/A**Rod Oven in Use:** Yes No N/A**Electrode to specification:** Yes No N/A**Weld Procedures Followed:** Yes No N/A**Qualified Welders:** Yes No N/A**Verified Joint Fit-up:** Yes No N/A**Approved Drawings:** Yes No N/A**Approved WPS:** Yes No N/A**Delayed / Cancelled:** Yes No N/A**Bridge No:** 34-0006**Component:** Orthotropic Box Girders**Summary of Items Observed:**

At the start of the shift the Quality Assurance Inspector (QAI) traveled to the project site and observed the following work performed by American Bridge/Fluor Enterprises (AB/F) personnel at the E1/E2, E2/E3, E3/E4, W1/W2 and W2/W3 field splices:

- A). Welding of the Field Splice E1 to E2.
- B). QC/NDT of the Field Splice E2 to E3
- C). Welding of the Field Splice E3 to E4
- D). Welding and QC/NDT of the Field Splice W1 to W2
- E). Welding Backing Bar to E2 Deck Plate
- F). Removal of Backing Bar

A) Welding of Field Splice E1/E2

The QAI observed the Flux Cored Arc Welding (FCAW-G) process of the side plate field splice identified as Weld Number (WN): 1E-2E-C. The vertical up (3G) welding was performed by the welding operators Rory Hogan ID-3186 and Jeremy Dolman ID-5042 utilizing the Welding Procedure Specification (WPS) ABF-WPS-D15-3042A-1 Rev. 0. The WPS was also used by the AB/F Quality Control (QC) Inspector James Cunningham to perform QC verification of the Direct Current Electrode Positive (DCEP) welding parameters during the Complete Joint Penetration (CJP) groove welding of the side plate field splice. The QAI also observed the QC inspector verifying the welding parameters and were noted as follows: 225 amps, 23.4 volts and a travel speed measured at 162 mm per minute. The QC inspector also monitored the minimum preheat temperature of 60

WELDING INSPECTION REPORT

(Continued Page 2 of 4)

degrees Celsius and the maximum interpass temperature of 230 degrees Celsius during the field welding.

B) QC/NDT of the Field Splice E2/E3

The QAI also observed the Ultrasonic Testing (UT) of the transverse CJP weld on side plate field splice identified as WN: 2E-3E-E. The testing was performed by the QC technicians Jesse Cayabyab and James Cunningham utilizing a USM 35 a product manufactured by Krautkramer. The QAI observed the UT technicians perform the required longitudinal and shear wave scanning technique during the testing which was performed utilizing a 1" diameter used to perform base metal soundness and a .75 x .75 rectangular transducers used to perform the angle beam technique for weld soundness. The technicians performed the testing utilizing the longitudinal and transverse scanning techniques as per the UT Procedure identified as SE-UT-D1.5-CT-100 Rev.4. There appears to be an approximate total of 3 rejects thus far.

C) Welding of the Field Splice E3 to E4

The QAI observed the automated FCAW-G welding process during the CJP welding of the side plate field splice performed by Mitch Sittinger ID-0315 and Songtao Huang ID-3794. The welders utilized the FCAW-G welding process as per the WPS ABF-WPS-D15-3042A-1 Rev. 0 which was also used as a reference by the Quality Control (QC) inspector Bonifacio Daquinag to verify the welding parameters and the surface temperatures during the welding operation. The DCEP welding parameters were verified and noted by the QC inspector and were noted as follows: 230 amps, 24.0 volts and a travel speed measured at 243 mm/minute. The minimum preheat temperature of 60 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius were maintained.

D) Welding of Field Splice W1/W2

The QAI observed the Shielded Metal Arc Welding (SMAW) and the Submerged Arc Welding (SAW) processes of the bottom plate field splice identified as Weld Number (WN): 1W-2W-D. The Complete Joint Penetration (CJP) groove welding was performed utilizing the SMAW process in the area of the weld access hole of the longitudinal stiffeners located on the bottom plate of the Orthotropic Box Girder (OBG) for a measured length of approximately 250mm. The SMAW was performed by AB/F welding personnel Chun Fai Tsui ID-3426 and James Zhen ID-6001 utilizing the Welding Procedure Specification (WPS) ABF-WPS-D15-1040C Rev. 1. The WPS was also used by the AB/F Quality Control (QC) Inspector Bernie Docena as a reference when performing QC verification of the Direct Current Electrode Positive (DCEP) welding parameters during the CJP welding of the groove joint identified as B-U2a. Later in the shift the QAI observed the QC inspector verifying the welding parameters during the fillet welding and the average amperage was noted as follows: 160 amps. Later in the shift the contractor commence the SAW of the above mentioned bottom plate splice and was performed by the welding operator, Jordan Hazelaar ID-2135, utilizing the WPS ABF-WPS-D15-4042B-1. The QC inspector performed the welding verification by recording the amperage and voltage which were observed and noted by the QAI as follows: 602 amps 32.5 volts and the travel speed was measured as 410 mm/minute. The QC inspector also monitored the surface temperatures during the field welding and the following was observed and noted by the QAI: the minimum preheat temperature of 20 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius.

WELDING INSPECTION REPORT

(Continued Page 3 of 4)

The QAI also observed the QC inspector Tom Pasqualone perform the Magnetic Particle Testing (MPT) on the CJP groove weld on the deck plate plate field splice identified as WN: 1W-2W-A. The surface appeared to be finished flush and smooth as per the contract documents. Mr. Pasqualone utilized the MPT procedure SE-MT-CT-D1.5-101 and the testing appeared to comply with this procedure. There were no rejectable indications noted by QC.

E) Welding of the Backing Bar to W2 Deck Plate

The QAI observed the Shielded Metal Arc Welding (SMAW) of the backing bar to the W1 deck plate performed by AB/F welding personnel Kenneth Chappell ID-3833. The fillet welding was performed utilizing the WPS identified as ABF-WPS-D15-F1200A Rev. 1 which was also used as a reference by the QC inspector Tom Pasqualone during the QC verification of the DCEP welding parameters which were observed and noted by the QAI were as follows: 170 amps. The surface temperatures were maintained during the CJP welding and were noted by the QAI as 10 degrees Celsius minimum preheat temperature and the maximum interpass temperature of 230 degrees Celsius.

F) Removal of the Backing Bar At Field Splice E2/E3

Later in the shift the QAI inspector observed the removal of the backing bar on the side plate field splice identified as WN: 2E-3E-E. The removal of the backing bar was performed by the AB/F personnel Salvador Sandavol utilizing the plasma arc cutting process.

QA Observation and Verification Summary

The QA inspector observed the QC activities and the welding of the field splices utilizing the WPS as noted above, which appeared to be posted at the weld station. The welding parameters and surface temperatures were verified by the QC inspector's and utilizing a Fluke 337 clamp meter for the electrical welding parameters and a Fluke 63 IR Thermometer for verifying the preheat and interpass temperatures. The consumables utilized for the SMAW process appeared to comply with the AWS Specification and AWS Classification. The QC inspection, testing and welding performed on this shift was not completed, except as noted, and appeared to be in general compliance with the contract documents. At random intervals, the QAI verified the QC inspection, testing, welding parameters and the surface temperatures utilizing various inspection equipment and gages which included a Fluke 337 Clamp Meter and Tempilstik Temperature indicators.

The QAI also generated an Incident Report, TI-15, of the misalignment of the bottom plate field splice identified as WN: 1W-2W-D. The dimensions of the misalignment are as follows: 4mm to 7.5mm and a length measured at 270mm.

The digital photographs on page 4 of this report illustrate the work observed during this scheduled shift.

WELDING INSPECTION REPORT

(Continued Page 4 of 4)



Summary of Conversations:

There were no pertinent conversations discussed in regards to the project except as noted above.

Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Mohammad Fatemi (916) 813-3677, who represents the Office of Structural Materials for your project.

Inspected By:	Reyes,Danny	Quality Assurance Inspector
Reviewed By:	Levell,Bill	QA Reviewer
